



Analytical Laboratory

Analytical Laboratory
Page 1 of 20

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: J10110299

Customer Name(s): Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins **Phone:** 980-875-5348

Report Authorized By: _____ **Date:** 12/16/2010
(Signature)

Program Comments:

FGD BiWeekly - 11/23

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with an "X" or "1" indicate a deviation from the method quality system or quality control requirement. All results are reported on a dry weight basis unless otherwise noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

| Sample ID | Plant/Station | Collection Date and Time | Collected By | Sample Description |
|-----------------|---------------|-----------------------------|--------------|--------------------|
| 2010011933 | BELEWS | 23-Nov-10 7:30 AM | W.WORKMAN | FGD PURGE EFF. |
| 2010011934 | BELEWS | 23-Nov-10 7:35 AM | W.WORKMAN | EQ TANK EFF. |
| 2010011935 | BELEWS | 23-Nov-10 7:40 AM | W.WORKMAN | BIOREACTOR 1 INF. |
| 2010011936 | BELEWS | 23-Nov-10 7:45 AM | W.WORKMAN | BIOREACTOR 2 INF. |
| 2010011937 | BELEWS | 23-Nov-10 7:50 AM | W.WORKMAN | BIOREACTOR 2 EFF. |
| 2010011938 | BELEWS | 23-Nov-10 8:15 AM | W.WORKMAN | FILTER BLANK |
| 2010011939 | BELEWS | 17-Nov-10 11:00 AM | C.KNOX | Trip Blank |
| 7 Total Samples | | | | |

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).

☒ Yes

☐ No

All Results are less than the laboratory reporting limits.

☐ Yes

☒ No

All laboratory QA/QC requirements are acceptable.

☒ Yes

☐ No

The Vendor Laboratories have been qualified by the Analytical Laboratory

Yes

Report Sections Included:

☒ Job Summary Report

☒ Sample Identification

☒ Technical Validation of Data Package

☒ Analytical Laboratory Certificate of Analysis

☐ Analytical Laboratory QC Report

☒ Sub-contracted Laboratory Results

☐ Customer Specific Data Sheets, Reports, & Documentation

☐ Customer Database Entries

☐ Test Case Narratives

☒ Chain of Custody

☒ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: DataBase Administrator

Date: 12/16/2010

Certificate of Laboratory Analysis*This report shall not be reproduced, except in full.***Order # J10110299**

Site: FGD PURGE EFF.

Collection Date: 23-Nov-10 7:30 AM

Sample #: 2010011933

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|--|----------|-------|------------|-----|-----------|--------------------|---------|
| <u>MERCURY (COLD VAPOR) IN WATER</u> | | | | | | | |
| Mercury (Hg) | 186 | ug/L | | 5 | EPA 245.1 | 02-Dec-10 14:27 | TLINN |
| <u>TOTAL RECOVERABLE METALS BY ICP</u> | | | | | | | |
| Boron (B) | 186 | mg/L | | 0.5 | EPA 200.7 | 01-Dec-10 12:08 | DJSULL1 |
| <u>DISSOLVED METALS BY ICP-MS</u> | | | | | | | |
| Selenium (Se) | 120 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 15:33 | KRICHAR |
| <u>TOTAL RECOVERABLE METALS BY ICP-MS</u> | | | | | | | |
| Arsenic (As) | 115 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Chromium (Cr) | 169 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Copper (Cu) | 91.3 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Nickel (Ni) | 153 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Selenium (Se) | 5570 | ug/L | | 20 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Silver (Ag) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| Zinc (Zn) | 211 | ug/L | | 20 | EPA 200.8 | 06-Dec-10 01:10 | KRICHAR |
| <u>SELENIUM SPECIATION</u> | | | | | | | |
| Vendor Parameter | Complete | | | | V_AS&C | | |
| <u>TOTAL DISSOLVED SOLIDS</u> | | | | | | | |
| Vendor Parameter | Complete | | | | V_PRISM | | |

Site: EQ TANK EFF.

Collection Date: 23-Nov-10 7:35 AM

Sample #: 2010011934

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|--|--------|-------|------------|-----|-----------|--------------------|---------|
| <u>MERCURY (COLD VAPOR) IN WATER</u> | | | | | | | |
| Mercury (Hg) | 131 | ug/L | | 2.5 | EPA 245.1 | 02-Dec-10 14:29 | TLINN |
| <u>TOTAL RECOVERABLE METALS BY ICP</u> | | | | | | | |
| Boron (B) | 199 | mg/L | | 0.5 | EPA 200.7 | 01-Dec-10 12:12 | DJSULL1 |
| <u>DISSOLVED METALS BY ICP-MS</u> | | | | | | | |
| Selenium (Se) | 108 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 15:39 | KRICHAR |
| <u>TOTAL RECOVERABLE METALS BY ICP-MS</u> | | | | | | | |
| Arsenic (As) | 107 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |
| Chromium (Cr) | 145 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |
| Copper (Cu) | 75.7 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |
| Nickel (Ni) | 147 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |
| Selenium (Se) | 4710 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Analytical Laboratory
Page 5 of 20

Order # J10110299

Site: EQ TANK EFF.

Collection Date: 23-Nov-10 7:35 AM

Sample #: 2010011934

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|---|--------|-------|------------|-----|-----------|--------------------|---------|
| TOTAL RECOVERABLE METALS BY ICP-MS | | | | | | | |
| Silver (Ag) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |
| Zinc (Zn) | 185 | ug/L | | 20 | EPA 200.8 | 06-Dec-10 00:29 | KRICHAR |

Site: BIOREACTOR 1 INF.

Collection Date: 23-Nov-10 7:40 AM

Sample #: 2010011935

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|---|----------|-------|------------|-----|-----------|--------------------|---------|
| TOTAL RECOVERABLE METALS BY ICP | | | | | | | |
| Boron (B) | 218 | mg/L | | 0.5 | EPA 200.7 | 01-Dec-10 12:16 | DJSULL1 |
| DISSOLVED METALS BY ICP-MS | | | | | | | |
| Selenium (Se) | 89.2 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 15:42 | KRICHAR |
| TOTAL RECOVERABLE METALS BY ICP-MS | | | | | | | |
| Arsenic (As) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Chromium (Cr) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Copper (Cu) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Nickel (Ni) | 28.4 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Selenium (Se) | 89.8 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Silver (Ag) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| Zinc (Zn) | < 20 | ug/L | | 20 | EPA 200.8 | 06-Dec-10 00:23 | KRICHAR |
| SELENIUM SPECIATION | | | | | | | |
| Vendor Parameter | Complete | | | | V_AS&C | | |

Site: BIOREACTOR 2 INF.

Collection Date: 23-Nov-10 7:45 AM

Sample #: 2010011936

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|---|--------|-------|------------|-----|-----------|--------------------|---------|
| TOTAL RECOVERABLE METALS BY ICP | | | | | | | |
| Boron (B) | 212 | mg/L | | 0.5 | EPA 200.7 | 01-Dec-10 12:20 | DJSULL1 |
| TOTAL RECOVERABLE METALS BY ICP-MS | | | | | | | |
| Arsenic (As) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Chromium (Cr) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Copper (Cu) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Nickel (Ni) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Selenium (Se) | 10.6 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Silver (Ag) | < 10 | ug/L | | 10 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |
| Zinc (Zn) | < 20 | ug/L | | 20 | EPA 200.8 | 06-Dec-10 00:18 | KRICHAR |

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Analytical Laboratory
Page 6 of 20

Order # J10110299

Site: BIOREACTOR 2 EFF.

Collection Date: 23-Nov-10 7:50 AM

Sample #: 2010011937

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|--|----------|-------|------------|-----|-----------|--------------------|---------|
| <u>MERCURY (COLD VAPOR) IN WATER</u> | | | | | | | |
| Mercury (Hg) | < 1 | ug/L | | 1 | EPA 245.1 | 02-Dec-10 14:32 | TLINN |
| <u>TOTAL RECOVERABLE METALS BY ICP</u> | | | | | | | |
| Boron (B) | 214 | mg/L | | 0.5 | EPA 200.7 | 01-Dec-10 12:24 | DJSULL1 |
| <u>TOTAL RECOVERABLE METALS BY ICP-MS</u> | | | | | | | |
| Arsenic (As) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Chromium (Cr) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Copper (Cu) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Nickel (Ni) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Selenium (Se) | 6.60 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Silver (Ag) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| Zinc (Zn) | < 4 | ug/L | | 4 | EPA 200.8 | 06-Dec-10 00:12 | KRICHAR |
| <u>SELENIUM SPECIATION</u> | | | | | | | |
| Vendor Parameter | Complete | | | | V_AS&C | | |

Site: FILTER BLANK

Collection Date: 23-Nov-10 8:15 AM

Sample #: 2010011938

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|--|--------|-------|------------|-----|-----------|--------------------|---------|
| <u>DISSOLVED METALS BY ICP-MS</u> | | | | | | | |
| Selenium (Se) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 15:50 | KRICHAR |

Site: Trip Blank

Collection Date: 17-Nov-10 11:00 AM

Sample #: 2010011939

Matrix: OTHER

| Analyte | Result | Units | Qualifiers | RDL | Method | Analysis Date/Time | Analyst |
|--|----------|-------|------------|------|-----------|--------------------|---------|
| <u>TOTAL RECOVERABLE METALS BY ICP</u> | | | | | | | |
| Boron (B) | < 0.05 | mg/L | | 0.05 | EPA 200.7 | 01-Dec-10 11:44 | DJSULL1 |
| <u>TOTAL RECOVERABLE METALS BY ICP-MS</u> | | | | | | | |
| Arsenic (As) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Chromium (Cr) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Copper (Cu) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Nickel (Ni) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Selenium (Se) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Silver (Ag) | < 1 | ug/L | | 1 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| Zinc (Zn) | < 2 | ug/L | | 2 | EPA 200.8 | 06-Dec-10 00:06 | KRICHAR |
| <u>SELENIUM SPECIATION</u> | | | | | | | |
| Vendor Parameter | Complete | | | | V_AS&C | | |



Full-Service Analytical &
Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert No. 37735

Analytical Laboratory
Page 6 of 6

Case Narrative

12/06/2010

Duke Energy Corporation
Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: Belews - FGD WWTS (Bi-Weekly Sampling)
Project No.: J10110299
Lab Submittal Date: 11/23/2010
Prism Work Order: 0110676

This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

Please call if you have any questions relating to this analytical report.

Respectfully,

PRISM LABORATORIES, INC.

VP Laboratory Services

Reviewed By

Data Qualifiers Key Reference:

| | |
|-----|--|
| BRL | Below Reporting Limit |
| MDL | Method Detection Limit |
| RPD | Relative Percent Difference |
| * | Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J. |

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



| Client Sample ID | Lab Sample ID | Matrix | Date Sampled | Date Received |
|--------------------------|---------------|--------|--------------|---------------|
| 2010011933/FGD Purge EFF | 0110676-01 | Water | 11/23/10 | 11/23/10 |

Samples received in good condition at 2.4 degrees C unless otherwise noted.



Duke Energy Corporation
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: Belews - FGD WWTS
(Bi-Weekly Sampling)
Project No.: J10110299
Sample Matrix: Water

Client Sample ID: 2010011933/FGD Purge E
Prism Sample ID: 0110676-01
Prism Work Order: 0110676
Time Collected: 11/23/10 07:30
Time Submitted: 11/23/10 15:05

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|-------------------------------------|--------|-------|-----------------|-----|--------------------|-----------|-----------------------|---------|-------------|
| General Chemistry Parameters | | | | | | | | | |
| Total Dissolved Solids | 12000 | mg/L | 50 | 8.7 | 1 | *SM2540 C | 11/30/10 14:35 | JAB | P0K0742 |



Duke Energy Corporation
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: Belews - FGD WWTS
(Bi-Weekly Sampling)
Project No: J10110299

Prism Work Order: 0110676
Time Submitted: 11/23/10 3:05:00PM

General Chemistry Parameters - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------|--------|--------------------|-------|-------------------------------|------------------|-------------------------------|--------|--------------|-------|
| Batch P0K0742 - NO PREP | | | | | | | | | |
| Blank (P0K0742-BLK1) | | | | Prepared & Analyzed: 11/30/10 | | | | | |
| Total Dissolved Solids | BRL | 50 | mg/L | | | | | | |
| LCS (P0K0742-BS1) | | | | Prepared & Analyzed: 11/30/10 | | | | | |
| Total Dissolved Solids | 992 | 50 | mg/L | 1000 | | 99 | 90-110 | | |
| Duplicate (P0K0742-DUP1) | | | | Source: 0110676-01 | | Prepared & Analyzed: 11/30/10 | | | |
| Total Dissolved Solids | 12300 | 50 | mg/L | | 12300 | | 0.5 | 20 | |

Sample Extraction Data

| NO PREP | | | | |
|----------------|---------|---------|-------|----------|
| Lab Number | Batch | Initial | Final | Date |
| 0110676-01 | P0K0742 | 50 mL | 50 mL | 11/30/10 |

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Analytical Laboratory
Page 11 of 20



Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

| | | |
|--|---------------|-------------------|
| 1) Project Name Belews - FGD | | 2) Phone No: |
| 2) Client: Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson ** | | 4) Fax No: |
| 5) Business Unit: | 6) Process: | Mail Code: |
| 8) Oper. Unit: | 9) Res. Type: | 10) Reso. Center: |

| Analytical Laboratory Use Only | | | |
|--|---|---|-------|
| ORDER# J10110299 | MATRIX: OTHER | Samples Originating From NCX SC | |
| Logged By Cpk | Date & Time 11-24-10 0958 | SAMPLE PROGRAM Water _____ Ground Water _____ Drinking Water _____ RCRA Waste _____ | |
| Vendor: AS&C PO# ISW01.1894 | Cooler Temp (C) 0 | | |
| Vendor: PRISM PO# ISW01.1913 | 15 Preserv.: 1=HCL 2=H ₂ SO ₄ 3=HNO ₃ 4=Ice 5=None | 4 3,4 | 4 3,4 |

¹⁹Page 1 of 2
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT
NOV 4 11 22 K

Customer to complete all appropriate non-shaded areas.

Sampling conducted: 2nd and 4th Wednesday

| LAB USE ONLY | |
|----------------------|--|
| ¹¹ Lab ID | |
| 2010011933 | |
| 934 | |
| 35 | |
| 936 | |
| 937 | |
| 938 | |
| 939 | |

| Se Speciation Bottle ID | ¹³ Sample Description or ID | Date | Time | Signature | ¹⁷ Comp. | ¹⁸ Grab | TDS (PRISM) | Hg - 245.1 | Metals* | Se, soluble | Se, speciation - vendor to AS&C (important to place filled bottle back into both baggies) |
|-------------------------|--|--------------|-------------|-------------------|---------------------|--------------------|-------------|------------|----------|-------------|---|
| B05801 | (01) FGD Purge Eff | 11/23 | 7:30 | W. Workman | | | 1 | 1 | 1 | 1 | 1 |
| | EQ Tank Eff. | 11/23 | 7:35 | | | | | 1 | 1 | 1 | |
| B06935 | BioReactor 1 Inf | 11/23 | 7:40 | | | | | | 1 | 1 | 1 |
| | BioReactor 2 Inf | 11/23 | 7:45 | | | | | | 1 | | |
| B06933 | BioReactor 2 Eff | 11/23 | 7:50 | | | | | 1 | 1 | | 1 |
| | Filter Blk | 11/23 | 8:15 | | | | | | | 1 | |
| B06379 | Metals Trip Blk | 11-17 | 1100 | C. K. May | | | | | 1 | | 1 |

The metals listed below will be analyzed during the months of Oct through January. Beginning in Feb. the metal analysis will fall back to 8 metals again: As, Ag, B, Cu, Cr, Ni, Se, Zn.

Customer to sign & date below - fill out from left to right.

| | | | |
|---|---|-------------------------------------|-----------------------------------|
| 1) Relinquished By W. Workman | Date/Time 11/23/10 14:15 hrs. | 2) Accepted By Courner | Date/Time 11-23-10 |
| 3) Relinquished By Courner | Date/Time 11-24-10 0830 | 4) Accepted By Cindy Knox | Date/Time 11-24-10 0830 |
| 5) Relinquished By Cindy Knox | Date/Time 11-24-10 1300 | 6) Accepted By David Mon | Date/Time 11-24-10 1405 |
| 7) Relinquished By David Mon | Date/Time 11-24-10 1505 | 8) Accepted By David Mon | Date/Time 11-24-10 1505 |
| 9) Seal/Locked By | Date/Time | 10) Seal/Lock Opened By | Date/Time |
| 11) Seal/Locked By | Date/Time | 12) Seal/Lock Opened By | Date/Time |

Customer, IMPORTANT!
Please indicate desired turnaround.

²²Requested Turnaround

14 Days _____

*7 Days
never due 12-6
- 48 Hr _____

*Other
* Add. Cost Will Apply

0110676

* Metals=As, Ag, B, Cu, Cr, Ni, Se, Zn thomas.d.johnson@siemens.com



**APPLIED SPECIATION
AND CONSULTING, LLC**

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

December 8, 2010

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: Belews – FGD WWTS (2010, Bi-Weekly Sampling) (LIMS # J10110299)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation analysis on November 29, 2010. The samples were received on November 30, 2010 in a sealed cooler at -0.2°C. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Any analytical issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Gerads", with a stylized, flowing script.

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: Belews – FGD WWTS (2010, Bi-Weekly Sampling) (LIMS # J10110299)

December 8, 2010

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on November 29, 2010. The samples were received on November 30, 2010 in a sealed container at -0.2°C.

The samples were received in a laminar flow clean hood void of trace metals contamination and ultra-violet radiation. Upon reception, the samples were designated discrete sample identifiers. An aliquot of each sample was filtered (0.45µm) and these filtrates were stored in a secure, monitored cryofreezer (maintained at a temperature of -80°C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-DRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into a sealed autosampler vial. No further sample preparation was performed as any chemical alteration of the samples may shift the equilibrium of the system resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is precluded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-DRC-MS All samples for selenium speciation analysis were analyzed by ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS) on November 30, 2010. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic ($\text{pH} > 7$) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went very well and no analytical issues were encountered. All quality control parameters associated with these samples were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not

contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Russell Gerads', with a large, sweeping flourish extending from the end of the name.

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS (2010, Bi-Weekly Sampling)
Contact: Jay Perkins
LIMS #J10110299

Date: December 8, 2010
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Sample Results

| Sample ID | Se(IV) | Se(VI) | SeCN | MeSe(IV) | SeMe | Unknown Se Species (n) |
|------------------|------------|-------------|------------|------------|------------|------------------------|
| FGD Purge Eff | 20.6 | 43.4 | ND (<3.9) | ND (<2.8) | ND (<2.8) | 0 (0) |
| BioReactor 1 Inf | 4.47 | 12.4 | ND (<0.97) | ND (<0.70) | ND (<0.70) | 0 (0) |
| BioReactor 2 Eff | ND (<0.71) | ND (<0.41) | ND (<0.97) | ND (<0.70) | ND (<0.70) | 0 (0) |
| Metals Trip Blk | ND (<0.14) | ND (<0.083) | ND (<0.19) | ND (<0.14) | ND (<0.14) | 0 (0) |

All results reflect the applied dilution and are reported in µg/L

ND = Not detected at the applied dilution

SeCN = Selenocyanate

MeSe(IV) = Methylseleninic acid

SeMe = Selenomethionine

Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS

n = number of unknown Se species observed

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS (2010, Bi-Weekly Sampling)
Contact: Jay Perkins
LIMS #J10110299

Date: December 8, 2010
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

| Analyte (µg/L) | PBW1 | PBW2 | PBW3 | PBW4 | Mean | StdDev | eMDL* | eMDL 10x | eMDL 50x | eMDL 200x |
|----------------|-------|-------|-------|-------|-------|--------|-------|----------|----------|-----------|
| Se(IV) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.14 | 0.71 | 2.8 |
| Se(VI) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.083 | 0.41 | 1.7 |
| SeCN | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 | 0.19 | 0.97 | 3.9 |
| MeSe(IV) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.14 | 0.70 | 2.8 |
| SeMe | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.014 | 0.14 | 0.70 | 2.8 |

eMDL = Estimated Method Detection Limit

*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

| Analyte (µg/L) | CRM | True Value | Result | Recovery |
|----------------|-----|------------|--------|----------|
| Se(IV) | ICV | 9.57 | 9.74 | 101.8 |
| Se(VI) | ICV | 9.48 | 9.25 | 97.5 |
| SeCN | ICV | 8.92 | 8.81 | 98.7 |
| MeSe(IV) | ICV | 6.47 | 6.85 | 105.9 |
| SeMe | ICV | 9.32 | 9.18 | 98.5 |

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS (2010, Bi-Weekly Sampling)
Contact: Jay Perkins
LIMS #J10110299

Date: December 8, 2010
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

| Analyte (µg/L) | Sample ID | Rep 1 | Rep 2 | Mean | RPD |
|----------------|-----------|-----------|-----------|-------|-------|
| Se(IV) | Batch QC | 435.1 | 452.0 | 443.5 | 3.8 |
| Se(VI) | Batch QC | 327.3 | 355.6 | 341.5 | 8.3 |
| SeCN | Batch QC | 8.20 | 5.05 | 6.6 | 47.6* |
| MeSe(IV) | Batch QC | 3.6 | 4.6 | 4.1 | 25.2* |
| SeMe | Batch QC | ND (<2.8) | ND (<2.8) | NC | NC |

ND = Not detected at the applied dilution

NC = Value was not calculated due to one or more concentrations below the eMDL

*Sample concentrations are within 5x the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

| Analyte (µg/L) | Sample ID | Spike Conc | MS Result | Recovery | Spike Conc | MSD Result | Recovery | RPD |
|----------------|-----------|------------|-----------|----------|------------|------------|----------|-----|
| Se(IV) | Batch QC | 1112 | 1448 | 90.3 | 1112 | 1471 | 92.4 | 1.6 |
| Se(VI) | Batch QC | 1009 | 1149 | 80.0 | 1009 | 1154 | 80.5 | 0.5 |
| SeCN | Batch QC | 915.0 | 681.7 | 74.5 | 915.0 | 689.2 | 75.3 | 1.1 |

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM



Duke Energy Analytical Laboratory

Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

| | | |
|----------------------------|-------------------------------------|--|
| ORDER# 510110299 | MATRIX: OTHER | Samples Originating From NCX SC |
| Logged By Cpk | Date & Time 11-24-10 0958 | SAMPLE PROGRAM Water Ground NPDES Drinking Water UST RCRA Waste |
| Vendor AS&C | PO# ISW01.1894 | Cooler Temp (C) 0 |
| Vendor PRISM | PO# ISW01.1913 | Preserv.: 1=HCL 2=H ₂ SO ₄ 3=HNO ₃ 4=Ice 5=None |

Analytical Laboratory

Page 20 of 20

DISTRIBUTION

ORIGINAL to LAB,
COPY to CLIENT

NOV 4 11 22 K

| | |
|--|-------------------|
| 1) Project Name Belews - FGD | 2) Phone No: |
| WWTS (2010, Bi-Weekly Sampling) | |
| 2) Client: Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson ** | 4) Fax No: |
| 5) Business Unit: | 6) Process: |
| | Mail Code: |
| 8) Oper. Unit: | 9) Res. Type: |
| | 10) Reso. Center: |

Customer to complete all
appropriate non-shaded areas.

Sampling conducted: 2nd and 4th Wednesday

| LAB USE ONLY |
|-------------------|
| 11 Lab ID |
| 2010011933 |
| 934 |
| 35 |
| 936 |
| 937 |
| 938 |
| 939 |

| Se Speciation Bottle ID | 13 Sample Description or ID | Date | Time | Signature | 17 Comp. | 18 Grab | TDS (PRISM) | Hg - 245.1 | Metals* | Se, soluble | Se, speciation - vendor to AS&C (important to place filled bottle back into both baggies) |
|-------------------------|-----------------------------|--------------|-------------|-------------------|----------|---------|-------------|------------|----------|-------------|---|
| B05801 | FGD Purge Eff | 11/23 | 7:30 | W. Workman | | | 1 | 1 | 1 | 1 | 1 |
| | EQ Tank Eff. | 11/23 | 7:35 | | | | | 1 | 1 | 1 | |
| B06935 | BioReactor 1 Inf | 11/23 | 7:40 | | | | | | 1 | 1 | 1 |
| | BioReactor 2 Inf | 11/23 | 7:45 | | | | | | 1 | | |
| B06933 | BioReactor 2 Eff | 11/23 | 7:50 | | | | 1 | 1 | | | 1 |
| | Filter Blk | 11/23 | 8:15 | | | | | | | 1 | |
| B06379 | Metals Trip Blk | 11-17 | 1100 | C. Kmot | | | | | 1 | | 1 |

The metals listed below will be analyzed during the months of Oct through January. Beginning in Feb. the metal analysis will fall back to 8 metals again: As, Ag, B, Cu, Cr, Ni, Se, Zn.

Customer to sign & date below - fill out from left to right.

| | | | |
|---|--|-------------------------------------|-----------------------------------|
| 4) Relinquished By W. Workman | Date/Time 11/23/10 14:15 hrs | 2) Accepted By Courner | Date/Time 11-23-10 |
| 3) Relinquished By Courner | Date/Time 11-24-10 0830 | 4) Accepted By Cindy Kmot | Date/Time 11-24-10 0830 |
| 5) Relinquished By Cindy Kmot | Date/Time 11-24-10 1300 | 6) Accepted By: | Date/Time |
| 7) Relinquished By Cindy Kmot | Date/Time 11-29-10 1300 | 8) Accepted By: | Date/Time |
| 9) Seal/Locked By Cpk | Date/Time 11-29-10 1230 | 10) Seal/Lock Opened By: | Date/Time |
| 11) Seal/Locked By: | Date/Time | 12) Seal/Lock Opened By: | Date/Time |

Comments

* Metals=As, Ag, B, Cu, Cr, Ni, Se, Zn thomas.d.johnson@siemens.com

Customer, IMPORTANT!
Please indicate desired turnaround

Requested Turnaround

14 Days _____

*7 Days

new due 12-6

*48 Hr _____

*Other _____

* Add. Cost Will Apply